

Practice: 558 - Roof Runoff Structure**Scenario: #1 - Roof Gutter, Small, 6 inches wide and smaller****Scenario Description:**

A small roof runoff structure, consisting of gutter(s) equal to or less than 6" wide, downspout(s) 5 inches wide or less, and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and convey runoff from roofs to a stable outlet.

After Situation:

A small gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system contaminating the runoff or creating soil erosion. Roof line of 200 ft serviced with gutter, downspouts, and appurtances.

Scenario Feature Measure: Linear Length of Roof to be Guttered

Scenario Unit: Linear Feet

Scenario Typical Size: 200

Scenario Cost: \$1,157.02

Scenario Cost/Unit: \$5.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.75	12	\$225.00
Materials						
Downspout, Aluminum, Small	1700	Aluminum downspout (3" to 5") in width with hangers. Materials only.	Foot	\$3.06	60	\$183.60
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.46	40	\$18.40
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Foot	\$2.81	200	\$562.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$168.02	1	\$168.02

Practice: 558 - Roof Runoff Structure**Scenario: #5 - Concrete Curb****Scenario Description:**

A roof runoff structure, consisting of a concrete curb or parabolic channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete curb. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A concrete curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (6" high - 2' wide) extending the length of a 200' roof with additional length (5') for stable outlet.

Scenario Feature Measure: Linear Length of Roof to be Curbed

Scenario Unit: Linear Feet

Scenario Typical Size: 200

Scenario Cost: \$2,150.85

Scenario Cost/Unit: \$10.75

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.10	16	\$33.60
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$1.88	30	\$56.40
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	\$0.32	60	\$19.20
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	\$14.55	6	\$87.30
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$112.96	10	\$1,129.60
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$23.38	7	\$163.66
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$23.07	7	\$161.49
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.80	2	\$499.60

Practice: 558 - Roof Runoff Structure**Scenario: #6 - Trench Drain****Scenario Description:**

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A 2' deep by 3' wide by 200 long deep rock filled, tile drained trench and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion.

Scenario Feature Measure: Linear Length of Roof to be Drained

Scenario Unit: Linear Feet

Scenario Typical Size: 200

Scenario Cost: \$2,014.88

Scenario Cost/Unit: \$10.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$1.88	44	\$82.72
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.10	222	\$466.20
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$23.38	44	\$1,028.72
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.46	220	\$101.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$168.02	2	\$336.04

Practice: 558 - Roof Runoff Structure**Scenario: #7 - Specialty Catchment****Scenario Description:**

A water catchment and retention system for collecting roof runoff from a livestock, poultry, nursery or similar operation utilizing tanks to store the water. Catch water from the roof is collected in gutters and is transported by downspout and pipe to storage tanks. Water will be stored and subsequently used on-farm. Tanks will have overflow protection. Overflow will be routed to a suitable outlet.

This typical scenario is based on catchment and retention of a four house poultry operation (4 – 40x400 poultry houses). Water collection for 0.8 inches (25 yr-5min storm event in SE).

Resource concerns: Sedimentation, erosion, excessive nutrients in surface water, stormwater runoff.

Associated practices: 342 - Critical Area Treatment, 516- Pipeline, 620-Underground Outlet, 561-Heavy Use Area Protection

Before Situation:

Erosion, sedimentation and nutrient deposition coming from roof runoff from poultry houses. Large roofs produce excess stormwater runoff for the farm. Numerous farms in a watershed result in cumulative excess stormwater runoff in the watershed resulting in degradation to receiving streams.

After Situation:

The guttering and downspouts collect the roof runoff and the water is conveyed through a pipe, to a storage tank for reuse. This system is the primary collection component of a Stormwater runoff will be reduced. Runoff and erosion control on the farm will be easier handled. Streambank erosion in the watershed will be reduced. Tanks will have overflow protection. Overflow will be routed to a suitable outlet.

Scenario Feature Measure: Volume of Collection (Tanks)

Scenario Unit: Gallon

Scenario Typical Size: 33,000

Scenario Cost: \$56,463.44

Scenario Cost/Unit: \$1.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$356.90	15	\$5,353.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.66	8	\$525.28
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$54.71	24	\$1,313.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.75	120	\$2,250.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.28	24	\$870.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$23.79	24	\$570.96
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.61	72	\$1,843.92
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	\$0.63	3000	\$1,890.00

Materials

Pipe, HDPE, 8", PCPT, Single Wall	1272	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8" diameter - ASTM F667. Material cost only.	Foot	\$1.98	3800	\$7,524.00
Tank, Fiberglass Enclosed Storage, 10,000 gallon	1919	10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery.	Each	\$7,888.14	3	\$23,664.42
Gutter, Plastic, Small	1389	5" PVC guttering emptying into a 4" PVC Sch-40 pipe	Foot	\$2.56	3200	\$8,192.00
Pipe, PVC, 8", SCH 40	981	Materials: - 8" - PVC - SCH 40 - ASTM D1785	Foot	\$9.83	200	\$1,966.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$249.80	2	\$499.60
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